CLAIMS

I claim:

1   1.   A method of operation for a half-duplex bus comprising:

2   asserting a preempt signal by a first agent to indicate that the first agent

3   has a read request pending for transmission over the half-duplex bus;

4   sampling the preempt signal by a second agent; and

5   relinquishing ownership of the half-duplex bus by the second agent

6   responsive to the preempt signal.

1   2.   The method of claim 1 further comprising:

2   sending the read request over the half-duplex bus from the first agent to

3   the second agent.

1   3.   The method of claim 1 further comprising:

2   returning ownership of the half-duplex bus back to the second agent;

3   sending read data over the half-duplex bus from the second agent to the

4   first agent.

1   4.   The method of claim 3 wherein the read data is associated with the read

2   request.

1   5.   The method of claim 1 wherein the second agent comprises a memory

2   controller.

1   6.   The method of claim 1 wherein the first agent comprises an input/output

2   device.

1   7.   A method of operation for a half-duplex bus comprising:

2   sending a read return over the half-duplex bus from a first agent to a

3   second agent;

4   signaling the first agent by the second agent that the second agent has a

5   read request pending;

6   electing by the first agent a suitable point at which to preempt the read

7   return;

8   granting ownership of the half-duplex bus to the second agent;

9   sending the read request from the second agent to the first agent over the

10   half-duplex bus; and

11   returning ownership of the half-duplex bus to the first agent.

1   8.   The method of claim 7 wherein the signaling step comprises:

2   asserting a request signal and a preempt signal by the second agent;

3   sampling the request signal and the preempt signal by the first agent.

1   9.   The method of claim 7 further comprising:

2   determining by the first agent that a threshold indicative of imminent read

3   starvation has been exceeded.

1   10. The method of claim 7 wherein the suitable point comprises a cacheline

2   boundary.

1   11. The method of claim 7 wherein the granting ownership and returning

2   ownership steps comprise a one clock period turnaround.

1   12.   The method of claim 7 wherein the first agent comprises a memory

2   controller.

1   13.   The method of claim 12 wherein the second agent comprises an

2   input/output bridge device.

1   14.   The method of claim 7 wherein the second agent includes an arbiter that

2   executes an arbitration protocol.

1   15.   The method of claim 14 wherein the arbiter of the first agent also

2   executes a preemption algorithm to elect the suitable point.

1   16.   A computer system comprising:

2   a half-duplex bus;

3   first and second agents coupled to the half-duplex bus, each having an

4   arbiter that follows an algorithm to determine ownership of the half-duplex bus;

5   first and second request lines coupled between the first and second

6   agents, the first request line being asserted by the first agent to request

7   ownership of the half-duplex bus from the second agent, and the second request

8   line being asserted by the second agent to request ownership of the half-duplex

9   bus from the first agent in accordance with the algorithm; and

10   a preempt signal that is asserted by the second agent to indicate to the

11   first agent that the second agent has a certain type of request pending.

1   17.   The computer system of claim 16 wherein the certain type of request is a

2   read request.

1   18. The computer system of claim 17 wherein the second agent asserts the

2   preempt signal during a current read return from the first agent to the second

3   agent.

1   19. The computer system of claim 18 wherein the arbiter of the first agent

2   responds to the preempt signal in accordance with a preemption algorithm that

3   determines a suitable point to relinquish ownership of the half-duplex bus to the

4   second agent.

1   20. The computer system of claim 19 wherein the suitable point comprises a

2   cacheline boundary.

1   21. The computer system of claim 16 wherein the first agent comprises a

2   memory controller.

1   22. The computer system of claim 21 wherein the second agent comprises

2   an input/output device.

1   23. The computer system of claim 19 wherein execution of the preemption

2   algorithm by the arbiter of the first agent causes the first agent to determine

3   whether a queue of read requests awaiting service by the first agent is below a

4   predetermined threshold.